

(NASA-TM-X-68552) ENVIRONMENTAL STATEMENT
FOR EARTH RESOURCES TECHNOLOGY SATELLITE
PROGRAM Draft Environmental Impact
Statement (NASA), Mar. 1971 6 p CSCL 22B

N72-27906

Unclas

00/31 34219

NTIS HC

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ENVIRONMENTAL STATEMENT

FOR

EARTH RESOURCES TECHNOLOGY SATELLITE PROGRAM

PRICES SUBJECT TO CHANGE

MARCH 1971

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
US Department of Commerce
Springfield, VA. 22151

6887

ENVIRONMENTAL STATEMENT

EARTH RESOURCES TECHNOLOGY SATELLITE PROGRAM

1. Program Objectives and Description

The Earth Resources Technology Satellite Program will design, develop, launch, and test a series of spacecraft to conduct experiments which will lead to a reliable assessment of the utility of spaceborne sensors for applications to problems related to natural and cultural resources. This assessment will lead to the capability to design spacecraft and related data handling systems to support these national programs on an operational basis. It will also lead to an evaluation of the complementary roles of aircraft and spacecraft in acquiring data on the earth's resources. This effort is progressing and will continue through the detailed design and fabrication of spacecraft, payloads, and ground systems required to launch, support, and operate two Earth Resources Technology Satellites; ERTS-A in the spring of Calendar Year 1972 and ERTS-B about one year later. Both satellites are planned for sun-synchronous orbit and are expected to have useful mission durations of one year each. ERTS-B will serve both as a backup to ERTS-A and as an improved version, capable of incorporating lessons learned in the course of fabricating ERTS-A and also capable of extending the sensitivity of the instruments into the thermal infrared region. These satellites will carry instrumentation that will meet the requirements of the user community in terms of

spatial and spectral resolution as well as repetitive coverage. Both framing and line scanning sensors will be flown in order to assess the advantages of each. The satellite system will also concurrently relay data from remote ground sensors such as rain gauges, stream gauges, and seismometers to assess the value of such a network for complementing the spaceborne sensors.

The data to be acquired by the instruments on ERTS-A and ERTS-B will be managed by the use of a specialized Ground Data Handling System (GDHS) now being constructed at the Goddard Space Flight Center. The GDHS is designed to receive, process, annotate, catalog, reproduce, and disseminate the large volume of high quality data needed to support the many investigations of applications planned to be conducted in discipline areas such as forestry, agriculture, geology, hydrology, geography, and oceanography. These data-use experiments will commence with the launch of ERTS-A and will continue through the useful mission duration of ERTS-B.

2. Probable Total Impact of the Program on the Environment

These missions will utilize the Nimbus-type spacecraft and the Thor Delta launch vehicles. The proven hardware and techniques have been studied and analyzed utilizing the Agency's and the nation's world leading experience in space flight. The assessment made on these basis indicates that there will be no significant adverse impact on the environment as a result of the Earth Resources Technology Satellite Program.

Atmosphere: Degradation of the environment by ERTS A and B is mainly limited to that caused by the relatively small contribution to the atmosphere of gases and particulates resulting from the burning of propellants in the launch vehicles. Because of the infrequency of such launches, it is believed that they cannot contribute significantly to the total burden of atmospheric pollution.

The launch vehicles currently used by NASA for automated science and applications missions range in size from the Scout to the Titan IIIC. The propellant combinations used in their stages include solids, LOX/Hydrogen, LOX/RP-1, IRFNA/UDMH, and N_2H_4 /UDMH/ N_2O_4 . A total of approximately 20 of these vehicles are launched annually from four launch sites: Wallops Island, Virginia; Western Test Range, California; Cape Kennedy, Florida; and the San Marco Platform in the Indian Ocean off Kenya.

These small and medium class launch vehicles are considerably smaller than the Saturn class, which is discussed in the Apollo Program Environmental Statement and it is concluded that no detrimental environmental impact results from these launches.

The ERTS A and B missions will be placed in a Polar orbit by Delta launch vehicles. Launches are scheduled in 1972 and 1973 from the Western Range, Vandenberg Air Force Base, California.

3. Alternatives to the Proposed Action

In arriving at the decision to undertake the ERTS A and B missions, alternate configurations were analyzed and studied prior to selection of the configuration to be employed. The environmental impacts of the

alternative configurations did not differ significantly. Thus, the question of alternative activities is not applicable to this statement.

4. Relationship Between Short-Term Uses of the Environment and Enhancement of Long-Term Productivity

It is expected that local short-term use of the environment in this program will contribute to the enhancement of long-term productivity. Economic studies conducted by NASA and other Government agencies indicate that considerable benefit could be obtained through eventual operational application of such a system. The ERTS system will demonstrate the validity of these concepts.

5. Irreversible/Irretrievable Commitments of Natural Resources

No depletion of natural resources will result from the ERTS Program.

6. Benefits

On the positive side, ERTS A and B are designed to acquire new and extensive data directly relating to conservation of the environment. Observations are to be made of the surface of the earth on a repetitive and contiguous basis for purposes aimed at solving problems in agriculture, forestry, geology, hydrology, geography, and oceanography. It is expected that information of importance to determining the extent and health of forests and crops will be obtained as well as about water sources and distributions. In the geography discipline, it is expected that many factors relating to land use, urbanization, large industrial activities and relationships among them will be observed on a repetitive

basis which will allow assessment of some effects upon the environment. ERTS-B will include a capability to acquire thermal maps of the terrain and oceans by means of which information about the extent and degree of thermal pollution of lakes, large streams, bays and estuaries can be detected, mapped and measured.

Hence, ERTS A and B are indeed specifically designed to investigate the means by which some important large-scale environmental parameters can be repetitively observed on the regional or global basis necessary for improved survey, control, and management.